

**SECRET**NPIC/TSSG/RED-1983-69  
31 December 1969

MEMORANDUM FOR: Chief, Technical Services &amp; Support Group

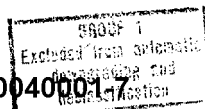
SUBJECT : Purchase of an Electron Microscope

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1. For the past several years we have been renting through [redacted] electron microscope, Model [redacted] with an ultimate resolution of 8 A. This instrument has been used to study grain structures of operational material and any other task requiring greater magnification than obtainable from optical microscopes. It also has an ability to take three dimensional high-magnification photographs of developed and un-developed silver halide crystals. The study of grain morphology (structure) as related to development conditions or developer composition is necessary to completely understand the nature of the final image. The comparison of the difference between dual gamma viscous versus interrupted spray processing should include the grain morphology of each system. The electron microscope would be very useful in this study. This instrument has a magnification capability ranging from 1,000X to 100,000X which is more than sufficient for our needs.

2. The Laboratory is required to keep abreast of the state-of-the-art in other than conventional silver halide photo systems. One of the criteria in evaluating a new system is a comparison of its resolution characteristics to that of conventional systems we are using today. These new systems have much greater resolution than our present silver halide system. To resolve the ultra fine particle size of these new unconventional systems far exceeds the capability of our current optical equipment. An electron microscope with the capability of looking at the structure of material in the molecular range will permit us to examine these particles without difficulty. This fact has been more than obvious to [redacted] as they have been using electronic microscopy to study the structure of their dry silver material. To properly evaluate their material and other non-silver systems, we should have the same capability.

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25X1 3. The list price of this particular instrument is [redacted]  
25X1 but, because the only available instrument from [redacted]  
25X1 was a demonstrator, [redacted] was able to obtain  
25X1 it at a reduced price of approximately [redacted]. We have paid them  
approximately [redacted] in rental for the equipment, with an option  
to buy, for use on the Image Analysis Program. We can purchase this  
instrument at an approximate cost of [redacted] (to be negotiated with  
[redacted])

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25X1 4. Although the instrument appears to be quite complex, I  
have been assured by [redacted], who is the importer of this  
piece of equipment, that they are generally operated by technicians.  
If the man is reasonably intelligent there should be no problem in  
25X1 training him. Although formal training courses are not provided by  
[redacted] they are willing to work with us to help train  
the man we choose to operate the instrument. It has been suggested  
that we send a man to one of the local government agencies to work  
with one of their knowledgeable operators and obtain training at a  
minimum cost to us. One man that has been suggested to help us is  
25X1 [redacted] at Beltsville Research Laboratories, Department of  
Agriculture. I feel certain through [redacted] (cleared  
TKH, SI) who is the Administrator for Research for the Department of  
Agriculture, we can arrange for training one of our junior physical  
scientists.

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25X1 5. It is recommended that the Laboratory be permitted to pur-  
25X1 chase the [redacted] electron microscope at a cost of approximately  
25X1 [redacted]. This purchase to be conditional upon the instrument being  
examined by [redacted] and certified to be in good operating  
25X1 condition. It is further requested that we be allowed to spend  
25X1 approximately [redacted] for a yearly maintenance service contract with  
[redacted]. This will include all parts and labor costs to  
keep this instrument in top working condition at all times. This  
instrument was not included in the FY-70 budget because its impact  
and utilization on dry-silver and non-silver emulsions had not been  
fully confirmed at the time of the FY-70 budget submission. Because  
of the leasing arrangement, the instrument most probably will not be  
available for purchase in FY-71; therefore, it appears essential to act  
now. In order to fund the instrument, RED has reviewed it's unobligated  
Miscellaneous Services Funds and recommends the transfer of the required

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25X1 [redacted] from our Miscellaneous Services Funds currently classified as "other". This approach has been coordinated with PPBS; actual reallocation would then take place during our mid-year review.

[redacted]  
Chief, Research & Engineering Division

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25X1 NPIC/TSSG/RED/ATB, [redacted]

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